

Lesson 1.3: Slope as a Rate of Change

- Rate of Change: A rate that describes how one quantity changes in relation to another

ex. 1: A wireless communication company charges its customer 15¢ per message for a text

Number of Messages Sent	Total Cost (\$)	Rate of Change in Total Cost (\$)
0	0	0
1	0.15	$0.15 - 0 = 0.15$
2	0.30	$0.30 - 0.15 = 0.15$
3	0.45	$0.45 - 0.30 = 0.15$

- Slope

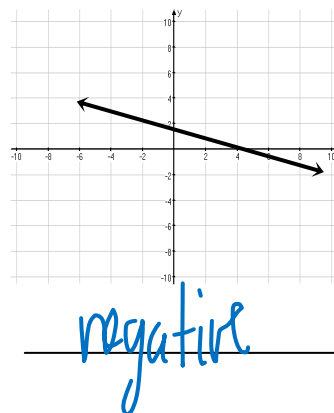
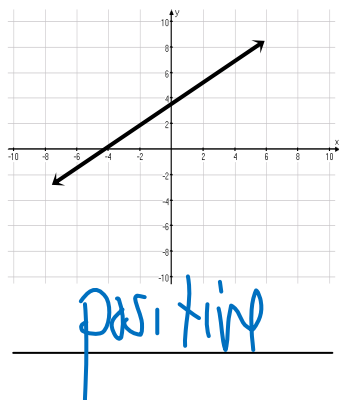
- ❖ the slope or gradient of a line describes its steepness, incline, or grade.
- ❖ A higher slope value indicates a steeper incline

$y = mx + b$
Slope

$\text{slope} = \frac{\text{Rise}}{\text{Run}}$
 $\text{slope} = \frac{y_2 - y_1}{x_2 - x_1}$
 $\text{slope} = \frac{\Delta y}{\Delta x}$

change

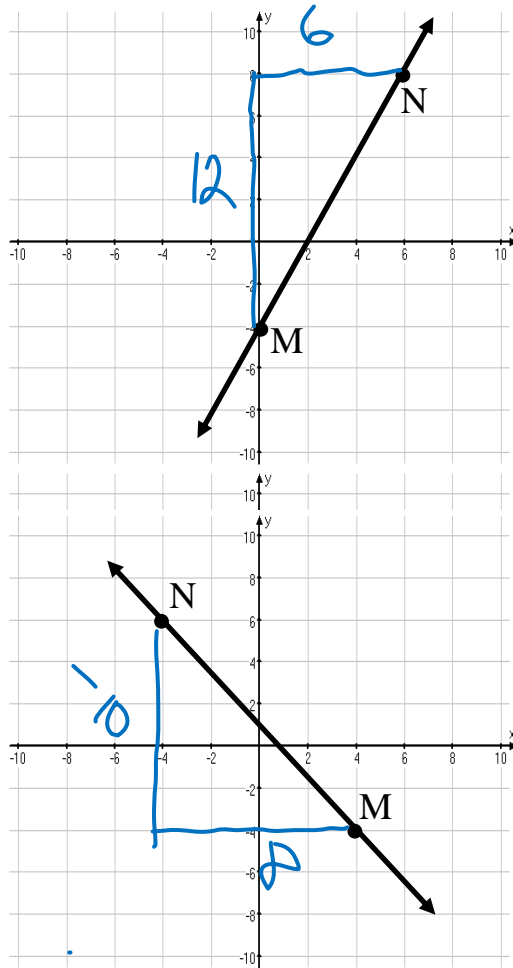
There are two types of slope:



Example 2: Calculate the Slope of a Given Line

Diagram

$$\begin{aligned} \text{Rise} &= 12 \\ \text{Run} &= 6 \\ \text{Slope} &= \frac{12}{6} \\ m &= 2 \end{aligned}$$



- Determine the rise from point M to point N.
- Determine the run from point M to point N.
- Calculate the slope of the line.
- What information about the pattern does the slope give?

$$\text{Rise} = -10$$

$$\text{Run} = 8$$

$$\text{Slope} = \frac{-10}{8} = \frac{-5}{4}$$

Example 3: For the linear relation $y = 3x + 1$ create a table of values, then determine the rate of change in the y-values.

x	y	Rate of Change
-2	-5	
-1	-2	$-2 - (-5) = 3$
0	1	$1 - (-2) = 3$
1	4	$4 - 1 = 3$
2	7	$7 - 4 = 3$
3	10	$10 - 7 = 3$

